# PHYTOCHEMISTRY

*CHEMISTRY BIOCHEMISTRY MOLECULAR BIOLOGY*

*Regional Editors*

*U.K., Africa, The Commonwealth & Rest of the World*
**G. P. BOLWELL**

*The Americas & East Asia*
**N. G. LEWIS**

*Continental Europe & Russia*
**D. STRACK**

Volume 54 Contents, Author Index and
Subject Index 2000

**PERGAMON**

# PHYTOCHEMISTRY
## Chemistry Biochemistry Molecular Biology



*Regional Editor for: U.K., Africa, The Commonwealth & Rest of the World*
G. P. BOLWELL: School of Biological Sciences, Royal Holloway, University of London, Egham, Surrey TW20 0EX, U.K.

*Regional Editor for: The Americas & East Asia*
N. G. LEWIS: Institute of Biological Chemistry, Washington State University, Pullman, WA 99164-6340, U.S.A.

*Regional Editor for: Continental Europe & Russia*
D. STRACK: Institut für Pflanzenbiochemie, Abt. Sekundarstoffwechsel, Weinberg 3, D-06120 Halle (Saale), Germany.

*Honorary Editor*: J. B. HARBORNE F.R.S.

EDITORIAL BOARD—2001

| | | | |
|---|---|---|---|
| Y. Asakawa: | Tokushima, Japan. | J. L. Harwood: | Cardiff, U.K. |
| W. Boland: | Jena, Germany. | P. Hedden: | Bristol, U.K. |
| A.-M. Boudet: | Toulouse, France. | W. Herz: | Tallahassee, U.S.A. |
| G. Bringmann: | Würzburg, Germany. | K. Hostettmann: | Dorigny-Lausanne, Switzerland. |
| G. Cordell: | Chicago, U.S.A. | T. M. Kutchan: | Halle, Germany. |
| K. Cornish: | Albany, U.S.A. | U. Matern: | Marburg, Germany. |
| R. Croteau: | Pullman, U.S.A. | B. L. Møller: | Copenhagen, Denmark. |
| H. V. Davies: | Dundee, U.K. | M. Rohmer: | Strasbourg, France. |
| V. De Luca: | Montreal, Canada. | U. Sankawa: | Toyama, Japan. |
| R. A. Dixon: | Ardmore, U.S.A. | A. R. Slabas: | Durham, U.K. |
| R. Edwards: | Durham, U.K. | G. H. N. Towers: | Vancouver, Canada. |
| W. H. Fenical: | La Jolla, U.S.A. | H. Wagner: | München, Germany. |
| D. Ferreira: | University, U.S.A. | P. G. Waterman: | Lismore, Australia. |
| J. Gershenzon: | Jena, Germany. | V. Wray: | Braunschweig, Germany. |
| O. R. Gottlieb: | Rio de Janeiro, Brazil. | M. H. Zenk: | Halle, Germany. |



All manuscripts and contributions should be submitted to either G. P. BOLWELL at Surrey, N. G. LEWIS at Pullman or D. STRACK at Halle. Authors are requested to consult the 'Instructions to Authors' and the 'Aims and Scope' of the journal (see inside back cover). The latest Instructions are published in Vol. 56, No. 1. Copies of these Instructions are also available from the internet http://www.elsevier.nl/locate/Phytochem under 'Guide for Authors', or from the Regional Editorial offices. Review articles are welcome, but intending Authors should send an outline to the Regional Editor before preparing their manuscripts. Books for review should be sent to G. P. BOLWELL.

This journal has been designated an official organ of 'The Phytochemical Society of Europe' and 'The Phytochemical Society of North America' and Society announcements will appear at regular intervals. Reduced subscription rates are available to members of both Societies (details available from Society offices).

**Publishing and Advertising Offices**: Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, U.K.

**Annual Subscription Information**: Published bi-monthly, two issues per month, January to December (three volumes 2001).

**Annual Institutional Subscription Rates 2001**: Europe, The CIS and Japan 6738.00 Dutch Guilders. All other countries US$3421.00. Associated Personal Subscription rates are available on request for those whose institutions are library subscribers. Dutch Guilder prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.

Any enquiry relating to subscriptions should be sent to: **The Americas**: Elsevier Science, Customer Support Department, P.O. Box 945, New York, NY, 10010, U.S.A. [Tel: (+1) 212-633-3730/1-888 4ES-INFO. Fax: (+1) 212-633-3680. E-mail: usinfo-f@elsevier.com]. **Japan**: Elsevier Science K. K., Customer Support Department, 9-15 Higashi-Azabu 1-chome, Minato-ku, Tokyo 106-0044, Japan [Tel: (+3) 5561-5033. Fax: (+3) 5561-5047. E-mail: info@elsevier.co.jp]. **Asia Pacific *(excluding Japan)***: Elsevier Science (Singapore) Pte Ltd, No. 1 Temasek Avenue, 17-01 Millenia Tower, Singapore 039192. [Tel: (+65) 434-3727. Fax: (+65) 337-2230. E-mail: asiainfo@elsevier.com.sg]. **Rest of the World**: Elsevier Science, Customer Service Department, P.O. Box 211, 1001 AE Amsterdam, The Netherlands. [Tel: (+31) 20-485-3757. Fax: (+31) 20-485-3432. E-mail: nlinfo-f@elsevier.nl]. *Microform back issues:* back issues of all previously published volumes in both hard copy and on microfilm, are available direct from Elsevier Science Offices (Oxford, New York).

**For queries relating to the general submission of articles (including electronic text and artwork) and the status of accepted manuscripts, please contact the Author Services Department at Elsevier Science Ltd. E-mail: authors@elsevier.co.uk; Fax: +44 (0) 1865 843905; Tel.: +44 (0) 1865 843900.**



**© 2001 Elsevier Science Ltd**



Periodicals postage paid at Rahway, New Jersey. *Phytochemistry* (ISSN 0031-9442) is published bi-monthly, two issues per month, January to December in three volumes, by Elsevier Science Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, U.K. The annual subscription in the USA is $3421.

*Phytochemistry* is circulated by Mercury International Limited, 365 Blair Road, Avenel, NJ 07001, U.S.A.
POSTMASTER: Please send address corrections to: *Phytochemistry*, c/o Customer Services, Elsevier Science Inc., 655 Avenue of the Americas, New York, NY 10010, U.S.A.


**Front cover illustration**: ***High lycopene tomato mutants***. Recently the article "Is lycopene beneficial to human health" by Peter M. Bramley appeared in *Phytochemistry*, 54 (2000) 233–236. The front cover illustration showing high lycopene containing tomato mutants complements this article. Top left: *Lycopersicon esculentum* Mill. cv. Ailsa Craig (wild type) showing fruit development and ripening; top right: old gold Crimson (*ogc*) mutant which contains elevated lycopene levels; bottom left: high pigment (*hp*) mutant having an increased lycopene and β-carotene content; bottom right: internal pigmentation in descending order wild type, *hp* and *ogc*. Hplc analysis of carotenoids are included showing the increased lycopene in the *ogc* mutant is due to the down-regulation of β-carotene formation (prepared by P. Fraser, J.W. Kaino and P.M. Bramley, Biochemistry Department, Royal Holloway University of London, Egham, Surrey, TW20 0EX).

# CONTENTS OF VOLUME 54

## Number 1


Biographies vii

Editorial xi

Graphical Abstracts xiii

**Molecules of Interest**

Nitric oxide in plants
To NO or not to NO — 1 P. WOJTASZEK

**Protein Biochemistry**

Purification and characterisation of vanadium haloperoxidases from the brown alga *Pelvetia canaliculata* — 5 M. G. ALMEIDA, M. HUMANES, R. MELO, J. A. SILVA, J. J. R. FRAÚSTO DA SILVA and R. WEVER

**Metabolism**

The configuration of methyl jasmonate affects paclitaxel and baccatin III production in *Taxus* cells — 13 Y. YUKIMUNE, Y. HARA, E. NOMURA, H. SETO and S. YOSHIDA

Differential expression of four sweet potato peroxidase genes in response to abscisic acid and ethephon — 19 K.-Y. KIM, H.-K. KWON, S.-Y. KWON, H.-S. LEE, Y. HUR, J.-W. BANG, K.-S. CHOI and S.-S. KWAK

Microbial hydroxylation/functionalization of terpenoid synthons derived from communic acids — 23 G. ARANDA, R. AZERAD, M. MAURS, G. BERTHO, D. JIMÉNEZ-GONZÁLEZ, E. CABRERA-TORRES and A. F. BARRERO

**Ecological Biochemistry**

Insecticidal piperidine alkaloid from *Microcos paniculata* stem bark — 29 K. A. N. P. BANDARA, V. KUMAR, U. JACOBSSON and L.-P. MOLLEYRES

The elicitin secreted by *Phytophthora palmivora*, a rubber tree pathogen — 33 N. CHURNGCHOW and M. RATTARASARN

Biotransformation of cadinane sesquiterpenes by *Beauveria bassiana* ATCC 7159 — 39 G. O. BUCHANAN, L. A. D. WILLIAMS and P. B. REESE

Naturally durable heartwood: evidence for a proposed dual defensive function of the extractives — 47 T. P. SCHULTZ and D. D. NICHOLAS

**Bioactive Plant Products**

Antimicrobial intermediates of the general phenylpropanoid and lignin specific pathways — 53 M. S. BARBER, V. S. MCCONNELL and B. S. DECAUX

The cyanobacterium *Nodularia* PCC 7804, of freshwater origin, produces [L-Har$^2$]nodularin — 57 K. A. BEATTIE, K. KAYA and G. A. CODD

**Plant Chemistry**

Oligostilbenoids in stem bark of *Vatica rassak* — 63 T. TANAKA, T. ITO, K. NAKAYA, M. IINUMA and S. RISWAN

African *Cucurbita pepo* L.: properties of seed and variability in fatty acid composition of seed oil — 71 Y. M. H. YOUNIS, S. GHIRMAY and S. S. AL-SHIHRY

Triterpene saponins from *Randia formosa* — 77 S. SAHPAZ, M. P. GUPTA and K. HOSTETTMANN

Contribution of each caffeoyl residue of the pigment molecule of gentiodelphin to blue color development — 85 K. YOSHIDA, Y. TOYAMA, K. KAMEDA and T. KONDO

Alkaloids and triterpenoids from *Ammocharis coranica* (Amaryllidaceae) — 93 N. KOORBANALLY, D. A. MULHOLLAND and N. CROUCH

Gum arabic glycoprotein contains glycomodules of both extensin and arabinogalactan-glycoproteins — 99 L. J. GOODRUM, A. PATEL, J. F. LEYKAM and M. J. KIELISZEWSKI


PII: S0031-9422(00)00390-3

New isoflavones from *Ceiba pentandra* 107 F. N. NGOUNOU, A. L. MELI, D. LONTSI, B. L. SONDENGAM, ATTA-UR-RAHMAN, M. I. CHOUDHARY, S. MALIK and F. AKHTAR

**Book Reviews**

*Chinese Materia Medica — Chemistry, Pharmacology and Application*, by You-Ping Zhu 111 B. DRÄGER

*Phytochemistry of Methods in Biotechnology, Vol. 10: Carbohydrate Biotechnology Protocols*, by C. Bucke 112 P. M. DEY

## Number 2

Graphical Abstracts vii

**Molecules of Interest**

Podophyllotoxin 115 C. CANEL, R. M. MORAES, F. E. DAYAN and D. FERREIRA

**Review Article**

Plant aromatic L-amino acid decarboxylases: evolution, biochemistry, regulation, and metabolic engineering applications 121 P. J. FACCHINI, K. L. HUBER-ALLANACH and L. W. TARI

**Protein Biochemistry**

Enzyme kinetics and chemical modification of α-1,4-glucan lyase from *Gracilariopsis* sp. 139 P. NYVALL, M. PEDERSÉN, L. KENNE and P. GACESA

Purification and characterization of polygalacturonase from banana fruit 147 N. PATHAK, S. MISHRA and G. G. SANWAL

**Metabolism**

Biosynthesis of avenacins and phytosterols in roots of *Avena sativa* cv. *Image* 153 M. R. TROJANOWSKA, A. E. OSBOURN, M. J. DANIELS and D. R. THRELFALL

**Ecological Biochemistry**

Dehydrozaluzanin C: a potent plant growth regulator with potential use as a natural herbicide template 165 F. A. MACÍAS, J. C. G. GALINDO, J. M. G. MOLINILLO and D. CASTELLANO

**Bioactive Plant Products**

The structure of cranberry proanthocyanidins which inhibit adherence of uropathogenic P-fimbriated *Escherichia coli* in vitro 173 L. Y. FOO, Y. LU, A. B. HOWELL and N. VORSA

Antifungal compounds from idioblast cells isolated from avocado fruits 183 F. DOMERGUE, G. L. HELMS, D. PRUSKY and J. BROWSE

**Plant Chemistry**

Iridoid glycosides from *Gmelina philippensis* 191 E. HELFRICH and H. RIMPLER

A sesquiterpene acid and flavonoids from *Polygonum viscosum* 201 B. K. DATTA, S. K. DATTA, M. A. RASHID, R. J. NASH and S. D. SARKER

Prenylated sulfonyl amides from *Glycosmis* species 207 O. HOFER, H. GREGER, B. LUKASEDER, S. VAJRODAYA and M. BACHER

New normethyl pentacyclic and lanostane-type triterpenes from *Adiantum venustum* 215 M. S. ALAM, N. CHOPRA, M. ALI and M. NIWA

Taxoids from the needles of the Canadian yew 221 J. ZHANG, F. SAURIOL, O. MAMER and L. O. ZAMIR

**Erratum**

Counlarins, limonoids and an alkaloid from *Clausena excavata* [Phytochemistry 52 (1999) 511–516] 231 T. T. THUY, H. RIPPERGER, A. PORZEL, T. VAN SUNG and G. ADAM

## Number 3

Graphical Abstracts vii

**Molecules of Interest**

Is lycopene beneficial to human health? 233 P. M. BRAMLEY

**Review Article**

Application of mass spectrometry for identification and structural studies of flavonoid glycosides — 237 M. Stobiecki

**Protein Biochemistry**

Monoterpene synthase activities in leaves of *Picea abies* (L.) Karst. and *Quercus ilex* L. — 257 R. J. Fischbach, I. Zimmer, R. Steinbrecher, A. Pfichner and J.-P. Schnitzler

Taxonomic distribution of plant glutathione S-transferases acting on xenobiotics — 267 S. Pflugmacher, P. Schröder and H. Sandermann Jr.

**Metabolism**

Phototropic stimulation induces the conversion of glucosinolate to phototropism-regulating substances of radish hypocotyls — 275 T. Hasegawa, K. Yamada, S. Kosemura, S. Yamamura and K. Hasegawa

**Ecological Biochemistry**

Two antifeedant lignans from the freshwater macrophyte *Saururus cernuus* — 281 J. Kubanek, W. Fenical, M. E. Hay, P. J. Brown and N. Lindquist

**Chemotaxonomy**

Lipid profile: a useful chemotaxonomic marker for classification of a new cyanobacterium in *Spirulina* genus — 289 I. Romano, M. R. Bellitti, B. Nicolaus, L. Lama, M. C. Manca, E. Pagnotta and A. Gambacorta

Fatty acids and tocochromanols in seeds of Orobanche — 295 L. Velasco, F. D. Goffman and A. J. Pujadas-Salvà

**Plant Chemistry**

Secondary metabolites characteristic of *Penicillium citrinum*, *Penicillium steckii* and related species — 301 J. Malmstrøm, C. Christophersen and J. C. Frisvad

3-Acetylaltholactone and related styryl-lactones, mitochondrial respiratory chain inhibitors — 311 E. Peris, E. Estornell, N. Cabedo, D. Cortes and A. Bermejo

Covalent anthocyanin–flavonol complexes from flowers of chive, *Allium schoenoprasum* — 317 T. Fossen, R. Slimestad, D. O. Øvstedal and Ø. M. Andersen

Composition of lipids from sunflower pollen (*Helianthus annuus*) — 325 S. Schulz, C. Arsene, M. Tauber and J. N. McNeil

8-*O*-Methyldioncophyllinol B and revised structures of other 7,6′-coupled naphthylisoquinoline alkaloids from *Triphyophyllum peltatum* (Dioncophyllaceae) — 337 G. Bringmann, C. Günther, W. Saeb, J. Mies, R. Brun and L. A. Assi

**Book Review**

*Biochemistry of Plant Secondary Metabolism*, edited by M. Wink — 347 T. Vogt

**Erratum**

Erratum to "Eudesmanolides and inositol derivatives from *Taraxacum linearisquameum*" [Phytochemistry, 51 (1999) 991–994] — 349 C. Zidorn, E. P. Ellmerer-Müller and H. Stuppner

**Corrigendum**

Corrigendum to "Oligostilbenes from *Vitis heyneana*" [Phytochemistry, 42 (1996) 1163–1165] — 351 W. Li, L. Ding, B. Li and Y. Chen

## Number 4

Graphical Abstracts — vii

Obituary: Leslie Crombie — xi J. B. Harborne

**Protein Biochemistry**

Oxidation of xenobiotics by plant microsomes, a reconstituted cytochrome P450 system and peroxidase: a comparative study — 353 M. Stiborová, H. H. Schmeiser and E. Frei

**Molecular Genetics and Genomics**

Species identification of Radix Astragali (Huangqi) by DNA sequence of its 5S-rRNA spacer domain — 363 X. Q. Ma, J. A. Duan, D. Y. Zhu, T. T. X. Dong and K. W. K. Tsim

**Metabolism**

Comparison of neutral lipid profile of various trilaminar outer cell wall (TLS)-containing microalgae with emphasis on algaenan occurrence — 369 B. Allard and J. Templier

Stereochemical fate of C-26 and C-27 during the conversion of isofucosterol to sitosterol and of 24-methylenecholesterol to campesterol and dihydrobrassicasterol in *Oryza sativa* cell cultures — 381 K. Nasu, K. Takahashi, M. Morisaki and Y. Fujimoto

Induction of clovamide by jasmonic acid in red clover — 387 S.-i. Tebayashi, A. Ishihara, M. Tsuda and H. Iwamura

**Ecological Biochemistry**

The effect of growth temperature on the long-chain alkenes composition in the marine coccolithophorid *Emiliania huxleyi* — 393 V. Grossi, D. Raphel, C. Aubert and J.-F. Rontani

**Chemotaxonomy**

Occurrence of diacylglyceryltrimethylhomoserines and major phospholipids in some plants — 401 O. A. Rozentsvet, V. M. Dembitsky and S. V. Saksonov

**Bioactive Plant Products**

Anti-inflammatory and immunologically active polysaccharides of *Periandra mediterranea* — 409 B. M. R. Pereira, B. P. da Silva, N. A. Pereira and J. P. Parente

An antimalarial stilbene from *Artocarpus integer* — 415 C. Boonlaksiri, W. Oonanant, P. Kongsaeree, P. Kittakoop, M. Tanticharoen and Y. Thebtaranonth

**Plant Chemistry**

Betalains from Christmas cactus — 419 N. Kobayashi, J. Schmidt, M. Nimtz, V. Wray and W. Schliemann

Six novel tetraterpenoid ethers, lycopanerols B-G, and some other constituents from the green microalga *Botryococcus braunii* — 427 M.-N. Rager and P. Metzger

Lignans causing photodiscoloration of *Tsuga heterophylla*: 8-hydroxy-oxomatairesinol from sapwood — 439 F. Kawamura, S. Kawai and H. Ohashi

**Book Review**

*Biotechnological Approaches in Biocontrol of Plant Pathogens*, edited by K. G. Mukerji, B. P. Chamola and R. K. Upadhyay — 445 L. C. van Loon

**Corrigendum**

Corrigendum to "Biosynthesis and metabolism of ascorbic acid in plants and of analogs of ascorbic acid in fungi" [Phytochemistry 52 (1999) 193–210] — 447 F. A. Loewus

**Erratum**

Erratum to "Specificities of the enzymes of *N*-alkyltropane biosynthesis in *Brugmansia* and *Datura*" [Phytochemistry 52 (1999) 871–878] — 449 H. D. Boswell, B. Dräger, W. R. McLauchlan, A. Portsteffen, D. J. Robins, R. J. Robins and N. J. Walton

## Number 5

Graphical Abstracts — vii

**Protein Biochemistry**

Cleavage specificity of cucumisin, a serine protease, with synthetic substrates — 451 K. Arima, H. Yonezawa, T. Uchikoba, M. Shimada and M. Kaneda

**Metabolism**

Microbial transformation of dehydropinguisenol by *Aspergillus* sp. — 455 E. H. Lahlou, Y. Noma, T. Hashimoto and Y. Asakawa

Acyl lipid composition variation related to culture age and nitrogen concentration in continuous culture of the microalga *Phaeodactylum tricornutum* — 461 D. L. Alonso, E.-H. Belarbi, J. M. Fernández-Sevilla, J. Rodríguez-Ruiz and E. Molina Grima

Secondary products in mycorrhizal roots of tobacco and tomato — 473 W. Maier, J. Schmidt, M. Nimtz, V. Wray and D. Strack

Inhibition of enzymatic browning and protection of sulfhydryl enzymes by thiol compounds 481 O. NEGISHI and T. OZAWA

**Ecological Biochemistry**

Potato micro-tuber inducing hydroxylasiodiplodins from *Lasiodiplodia theobromae* 489 Q. YANG, M. ASAI, H. MATSUURA and T. YOSHIHARA

**Chemotaxonomy**

Differences in the floral anthocyanin content of red petunias and *Petunia exserta* 495 T. ANDO, F. TATSUZAWA, N. SAITO, M. TAKAHASHI, Y. TSUNASHIMA, H. NUMAJIRI, H. WATANABE, H. KOKUBUN, R. HARA, H. SEKI and G. HASHIMOTO

**Bioactive Plant Products**

Neuroprotective phenylpropanoid esters of rhamnose isolated from roots of *Scrophularia buergeriana* 503 S. R. KIM and Y. C. KIM

**Chemistry**

Secondary metabolites from a *Gloeophyllum* species 511 F. RASSER, T. ANKE and O. STERNER

Simultaneous determination of scopolamine, hyoscyamine and littorine in plants and different hairy root clones of *Hyoäscyamus muticus* by micellar electrokinetic chromatography 517 L. MATEUS, S. CHERKAOUI, P. CHRISTEN and K.-M. OKSMAN-CALDENTEY

Occurrence and characterization of oils rich in γ-linolenic acid Part II: fatty acids and squalene from Macaronesian *Echium* leaves 525 J. L. GUIL-GUERRERO, F. GARCÍA-MAROTO, P. CAMPRA-MADRID and F. GÓMEZ-MERCADO

Cytotoxic cardenolides and antibacterial terpenoids from *Crossopetalum gaumeri* 531 A. ANKLI, J. HEILMANN, M. HEINRICH and O. STICHER

The phenols and prodelphinidins of white clover flowers 539 L. Y. FOO, Y. LU, A. L. MOLAN, D. R. WOODFIELD and W. C. MCNABB

**Book Review**

*Induced Plant Defences Against Pathogens and Herbivores*, edited by A. A. Agrawal, S. Tuzun and E. BENT 549 J. B. HARBORNE

**Corrigendum**

Corrigendum to "Sesquiterpenes from *Leontopodium alpinum*" [Phytochemistry 50 (1999) 1057–1060] 551 A. I. GRAY, I. L. HOOK, P. JAMES and H. SHERIDAN

## Number 6

Graphical Abstracts vii

**Protein Biochemistry**

Trypsin inhibitor from *Dimorphandra mollis* seeds: purification and properties 553 M. L. R. MACEDO, D. G. G. DE MATOS, O. L. T. MACHADO, S. MARANGONI and J. C. NOVELLO

Isolation and characterization of a serine protease from the sprouts of *Pleioblastus hindsii* Nakai 559 K. ARIMA, T. UCHIKOBA, H. YONEZAWA, M. SHIMADA and M. KANEDA

Purification and characterization of a $NAD^+$-dependent sorbitol dehydrogenase from Japanese pear fruit 567 Y. OURA, K. YAMADA, K. SHIRATAKE and S. YAMAKI

Redox status of cytochrome oxidase in darkened leaf of $C_4$ crop plants 573 P. SINGH

**Molecular Genetics and Genomics**

Leaf sheath cuticular waxes on bloomless and sparse-bloom mutants of *Sorghum bicolor* 577 M. A. JENKS, P. J. RICH, D. RHODES, E. N. ASHWORTH, J. D. AXTELL and C.-K. DING

**Ecological Biochemistry**

Role of malonate in chickpeas 585 J. LI and L. COPELAND

**Bioactive Plant Products**

Stereostructure and anti-inflammatory activity of three ädiastereomers of ocobullenone from *Ocotea bullata* 591 S. ZSCHOCKE, J. VAN STADEN, K. PAULUS, R. BAUER, M. M. HORN, O. Q. MUNRO, N. J. BROWN and S. E. DREWES

**Chemistry**

Sphaerolone and dihydrosphaerolone, two bisnaphthyl-pigments from the fungus *Sphaeropsidales* sp. F-24'707 — 597 H. B. Bode and A. Zeeck

Constituents of various wood-rotting basidiomycetes — 603 J. Rösecke and W. A. König

Flavonoids from the stem bark of *Lonchocarpus xuul* — 611 R. Borges-Argáez, L. M. Peña-Rodríguez and P. G. Waterman

Characterization of some *O*-acetylated saponins from *Quillaja saponaria* Molina — 615 S. Guo and L. Kenne

Further sesquiterpene lactones from *Anthemis carpatica* — 625 V. Vajs, N. Todorović, V. Bulatović, N. Menković, S. Macura, N. Juranić and S. Milosavljević

Glycosidic compounds of murolic, protoconstipatic and allo-murolic acids from lichens of Central Asia — 635 T. Řezanka and I. A. Guschina

Announcement — 647

## Number 7

Graphical Abstracts — vii

**Protein Biochemistry**

Flavanone 8-dimethylallyltransferase in *Sophora flavescens* cell suspension cultures — 649 H. Yamamoto, M. Senda and K. Inoue

Molecular cloning and functional bacterial expression of a plant glucosidase specifically involved in alkaloid biosynthesis — 657 H. Warzecha, I. Gerasimenko, T. M. Kutchan and J. Stöckigt

**Metabolism**

Differences in catalytic properties between native isoenzymes of xyloglucan endotransglycosylase (XET) — 667 N. M. Steele and S. C. Fry

**Ecological Biochemistry**

Cell wall sited flavonoids in lisianthus flower petals — 681 K. R. Markham, K. G. Ryan, K. S. Gould and G. K. Rickards

Coronatine elicits phytoalexin production in rice leaves (*Oryza sativa* L.) in the same manner as jasmonic acid — 689 S. Tamogami and O. Kodama

**Chemotaxonomy**

Flavonoid and benzophenone glycosides from *Coleogyne ramosissima* — 695 H. Ito, E. Nishitani, T. Konoshima, M. Takasaki, M. Kozuka and T. Yoshida

**Chemistry**

Pelargoniins, new ellagitannins from *Pelargonium reniforme* — 701 K. P. Latté and H. Kolodziej

Bisbenzylisoquinoline alkaloids from *Guatteria boliviana* (Annonaceae) — 709 V. Mahiou, F. Roblot, A. Fournet and R. Hocquemiller

Sesquiterpenoids from *Ferula kuhistanica* — 717 B. Chen, R. Teranishi, K. Kawazoe, Y. Takaishi, G. Honda, M. Itoh, Y. Takeda and O. K. Kodzhimatov

*ent*-Kaurene and squalene synthesis in *Fusarium fujikuroi* cell-free extracts — 723 R. Fernández-Martín, C. Domenech, E. Cerdá-Olmedo and J. Avalos

**Book Review**

*Current Advances in Mycorrhizae Research*, edited by G. W. Podila and D. D. Douds — 729 J. B. Harborne

## Number 8

Graphical Abstracts — ix

**Bioactive Plant Products**

Insecticidal rocaglamide derivatives from *Aglaia spectabilis* (Meliaceae) 731 C. Schneider, F. I. Bohnenstengel, B. W. Nugroho, V. Wray, L. Witte, P. D. Hung, L. C. Kiet and P. Proksch

A geranylated chalcone with 5α-reductase inhibitory properties from *Artocarpus incisus* 737 K. Shimizu, R. Kondo, K. Sakai, S. Buabarn and U. Dilokkunanant

**Terpenoids**

Saikosaponins from roots of *Bupleurum gibraltaricum* and *Bupleurum spinosum* 741 A. F. Barrero, A. Haïdour, A. Sedqui, A. I. Mansour, I. Rodríguez-García, A. López and M. Muñoz-Dorado

Volatile constituents of wood-rotting basidiomycetes 747 J. Rösecke, M. Pietsch and W. A. König

Triterpene saponins and iridoid glucosides from *Galium rivale* 751 S. de Rosa, C. Iodice, M. Mitova, N. Handjieva, S. Popov and M. Anchev

Constituents of the fungi *Daedalea quercina* and *Daedaleopsis confragosa* var. *tricolor* 757 J. Rösecke and W. A. König

Sesquiterpenoids and phenolics from *Crepis mollis* 763 W. Kisiel, K. Zielińska and S. P. Joshi

Diterpenoids from the roots of *Croton macrostachys* 767 M. C. Kapingu, D. Guillaume, Z. H. Mbwambo, M. J. Moshi, F. C. Uliso and R. L. A. Mahunnah

Labdane diterpenes from *Otostegia fruticosa* 771 N. M. Al-Musayeib, F. A. Abbas, M. S. Ahmad, J. S. Mossa and F. S. El-Feraly

Highly oxidized cuparene-type sesquiterpenes from a mycelial culture of *Flammulina velutipes* 777 N. K. Ishikawa, K. Yamaji, S. Tahara, Y. Fukushi and K. Takahashi

Minor sulfated saikosaponins from the aerial parts of *Bupleurum rigidum* L. 783 S. Sánchez-Contreras, A. M. Díaz-Lanza, C. Bartolomé and M. Bernabé

Sesquiterpenoids from roots of *Taraxacum laevigatum* and *Taraxacum disseminatum* 791 K. Zielińska and W. Kisiel

Saponins from *Lonicera bournei* 795 T. Xiang, Y. Tezuka, L.-J. Wu, A. H. Banskota and S. Kadota

Tirucallane triterpenoids from *Dysoxylum hainanense* 801 X.-D. Luo, S.-H. Wu, Y.-B. Ma and D.-G. Wu

Iridoids from *Caryopteris* x *clandonensis* 807 S. Hannedouche, E. Stanislas, C. Moulis and I. Fourasté

Sesquiterpene lactone and friedelane derivative from *Drypetes molunduana* 811 J. Wandji, J. D. Wansi, V. Fuendjiep, E. Dagne, D. A. Mulholland, F. Tillequin, Z. T. Fomum, B. L. Sondengam, B. C. Nkeh and D. Njamen

Triterpenoid saponins from *Ardisia mamillata* 817 J. Huang, Y. Ogihara, H. Zhang, N. Shimizu and T. Takeda

Two oleanane triterpenoids from *Gordonia ceylanica* and their conversions to taraxarane triterpenoids 823 H. M. T. B. Herath, P. S. Athukoralage and J. F. Jamie

Taxane diterpenoids from *Taxus yunnanensis* and *Taxus cuspidata* 829 Q.-W. Shi, T. Oritani, H. Kiyota and D. Zhao

Euphane triterpenoid and lipid constituents from *Butea monosperma* 835 M. Mishra, Y. N. Shukla and S. Kumar

Neutral taxoids from *Taxus cuspidata* as modulators of multidrug-resistant tumor cells 839 K. Kosugi, J.-i. Sakai, S. Zhang, Y. Watanabe, H. Sasaki, T. Suzuki, H. Hagiwara, N. Hirata, K. Hirose, M. Ando, A. Tomida and T. Tsuruo

Diterpene glucosides from *Pieris formosa* 847 L.-Q. Wang, S.-N. Chen, K.-F. Cheng, C.-J. Li and G.-W. Qin

Triterpenoid saponins from *Fagonia cretica* 853 S. M. A. Khalik, T. Miyase, H. A. El-Ashaal and F. R. Melek

Triterpenoidal constituents from *Eucalyptus camaldulensis* var. *obtusa* leaves 861 B. S. Siddiqui, I. Sultana and S. Begum

Prieurianoside, a protolimonoid glucoside from the leaves of *Trichilia prieuriana* 867 T. A. Olugbade and S. A. Adesanya

**Phenolics**

A stilbene and dihydrochalcones with radical scavenging activities from *Loiseleuria procumbens* 871 M. Cuendet, O. Potterat, A. Salvi, B. Testa and K. Hostettmann

Stilbene dimers from the lianas of *Gnetum hainanense* 875 K.-S. Huang, Y.-H. Wang, R.-L. Li and M. Lin

Benzophenone glycosides from *Gnidia involucrata* 883 J. Ferrari, C. Terreaux, S. Sahpaz, J. D. Msonthi, J.-L. Wolfender and K. Hostettmann

Minor phenolics from *Crinum bulbispermum* bulbs 891 M. A. Ramadan, M. S. Kamel, K. Ohtani, R. Kasai and K. Yamasaki

Spectral comparisons of coniferyl and cinnamyl alcohol epoxide derivatives with a purported *cis*-epoxyconiferyl alcohol isolate 897 N. R. Guz and F. R. Stermitz

Dihydroflavonols from *Lannea coromandelica* 901 Md. T. Islam and S. Tahara

Lignans from *Mosla scabra* 909 Q. Wang, C. Terreaux, A. Marston, R.-X. Tan and K. Hostettmann

Acylated delphinidin 3-rutinoside-5-glucosides in the flowers of *Petunia reitzii* 913 F. Tatsuzawa, T. Ando, N. Saito, T. Kanaya, H. Kokubun, Y. Tsunashima, H. Watanabe, G. Hashimoto, R. Hara and H. Seki

Anthocyanins in callus induced from purple storage root of *Ipomoea batatas* L. 919 N. Terahara, I. Konczak-Islam, M. Nakatani, O. Yamakawa, Y. Goda and T. Honda

Phenylpropanoid glycosides from *Scrophularia ningpoensis* 923 Y.-M. Li, S.-H. Jiang, W.-Y. Gao and D.-Y. Zhu

**Alkaloids**

Tropane alkaloids from the leaves and stem bark of *Erythroxylon alaternifolium* and *Erythroxylon rotundifolium* 927 A. L. Payo-Hill, R. S. Dominguez, M. O. Suarez, M. Batista-Baez, H. T. V. Castro, L. Rastrelli and R. Aquino

Structure revision of isoline (ruwenine), bisline and isolinecic acid 933 L. Susag, M. Parvez, S. Mathenge and M. H. Benn

Caffeine: also a fungal metabolite 937 A. Bogo and P. G. Mantle

Indole alkaloids from a culture of the fungus *Aporpium caryae* 941 L. M. Levy, G. M. Cabrera, J. E. Wright and A. M. Seldes

Alkaloids from *Crinum macowanii* 945 J. J. Nair, A. K. Machocho, W. E. Campbell, R. Brun, F. Viladomat, C. Codina and J. Bastida

Four steroidal alkaloids from the leaves of *Buxus sempervirens* 951 F. Loru, D. Duval, A. Aumelas, F. Akeb, D. Guédon and R. Guedj

Alkaloids from *Isopyrum thalictroides* L. 959 R. S. Istatkova and S. A. Philipov

**Chemistry**

Fatty acid amides from freshwater green alga *Rhizoclonium hieroglyphicum* 965 V. M. Dembitsky, I. Shkrob and O. A. Rozentsvet

Triterpenoids, essential oil and photo-oxidative 28 → 13-lactonization of oleanolic acid from *Lantana camara* 969 L. Misra and H. Laatsch

Diarylheptanoids from *Myrica arborea* 975 M. Tene, H. K. Wabo, P. Kamnaing, A. Tsopmo, P. Tane, J. F. Ayafor and O. Sterner

Constituents of *Chondria armata* 979 M. B. Govenkar and S. Wahidulla

$C_{21}$ steroidal glycosides from *Hemidesmus indicus* 983 P. Sigler, R. Saksena, D. Deepak and A. Khare

A 6-substituted-5,6-dihydro-2-pyrone from *Cryptocarya ästrictifolia* 989 L. D. Juliawaty, M. Kitajima, H. Takayama, S. A. Achmad and N. Aimi

Fluorescence studies of ATP-diphosphohydrolase from *Solanum tuberosum* var. Desirée 995 V. Espinosa, A. M. Kettlun, A. Zanocco, E. Cardemil and M. A. Valenzuela